

**REMARKS/ARGUMENTS**

Claims 1-6, 12-17, 19, 21-25, 27 and 30 stand rejected in the outstanding Official Action. Claims 1 and 27 have been amended and therefore claims 1-6, 12-17, 19, 21-25, 27 and 30 remain in this application.

The Examiner's acknowledgment of Applicants' claim for foreign priority and receipt of the certified copy of the priority document is very much appreciated. Additionally, the Examiner's indication of PTO acceptance of the previously filed formal drawings is appreciated. Finally, the Examiner's acknowledgment of having considered the prior art submitted with Applicants' Information Disclosure Statement is very much appreciated.

Claim 27 stands objected to on page 2 of the Official Action as lacking proper antecedent basis. The Examiner is correct in noting that claim 27 should have been dependent from claim 24. The above amendment to claim 27 corrects the dependency, thereby obviating any further objection to claim 27.

Minor amendments to claim 1 were also made so that the claim more accurately illustrates the elements as combined to form the optical wavelength division multiplexer/demultiplexer. Consideration and entry of these amendments is respectfully requested.

Claims 1-6, 12-14, 17, 19, 22, 23 and 30 stand rejected under 35 USC §103 as unpatentable over Tu (U.S. Patent 6,219,470) in view of Miura ("Modeling and Fabrication of Hollow Optical Waveguide for Photonic Integrated Circuits"). The Examiner, in the paragraph bridging pages 2 and 3 of the Official Action, makes a number of unfounded and unsupported allegations with respect to the Tu reference.

Firstly, the Examiner alleges that “Tu teaches an optical wavelength division multiplexer/demultiplexer device (Fig. 3).” This is factually incorrect as those of ordinary skill in the art would understand and appreciate that the device shown in Figure 3 of the Tu patent only performs demultiplexing, i.e., some spectral component output from fiber 312 is diverted by filter 303 to the receiver 311. It will be clearly understood that, when the device operates to input light to the fiber 312 (rather than receive light from it), light from the transmitter 307 passes through lenses 309a, b and c and the “dams” of the components. Thus, there is no multiplexing function performed and the device only performs demultiplexing.

The preamble of Applicants’ claim 1 specifies a “multiplexer/demultiplexer” and this is described in detail in the PCT specification, page 1, lines 18-20, page 3, line 14 and page 13, lines 5-7. As a result of the above, Tu simply does not disclose any multiplexer/demultiplexer and is limited only to the teaching of a “demultiplexer” structure.

Secondly, the Examiner alleges that Tu teaches “a plurality of wavelength selecting filters (303, 304, 305).” A review of column 3, lines 47-58 will indicate that while element 303 is a filter (“dielectric multilayered filter 303” col. 3, lines 49-50), element 304 is not (it is a “dielectric multilayered half-mirror 304” col. 3, lines 52-53) and elements 305 are not either (they are “dielectric multilayered antireflectors 305a and 305b” col. 3, lines 57-58). Thus, in the elements cited by the Examiner, only the first, 303, is a wavelength selecting filter and therefore the Tu reference fails to disclose Applicants’ claimed “plurality of wavelength selecting filters” (emphasis added).

Thirdly, in the sentence bridging pages 2 and 3 of the Official Action, the Examiner alleges that Tu teaches waveguides 312 formed in the substrate to guide light between the

wavelength filters. This is also believed unsupported by the Tu reference. Waveguide 312 is in fact an optical fiber which serves to input light to the Tu device. This is analogous to an electric wire providing a signal to a black box. The subject matter in the black box does not comprise the wire that provides the signal.

Moreover, waveguide 312 is only a single waveguide, is not a part of a multiplexer/demultiplexer and does not convey light between the Examiner's purported wavelength selecting filters (303, 304 and 305). For example, Tu at column 4, lines 6-13, discusses that light "from the optical fiber 312 is reflected by the multilayered filter 303" and directed to receiver 311. The other receiver 310 has another light optical beam also "coming **from** the optical fiber 312" being reflected from the half-mirror 304. What the Examiner may not appreciate is that internal to the Tu device the operation is in free space and light from the fiber 312 passes through the silicon dams between the lenses without fiber optic guidance.

There is no indication that single waveguide 312 is located between the alleged mirrors 303, 304 or 305. Without being located between the mirrors or filters, Tu clearly fails to teach "wherein hollow core waveguides are formed in said substrate to guide light **between the wavelength selecting filters.**" (emphasis added, claim 1).

Thus, in view of the above, the Tu reference clearly does not teach the claimed mux/demux device, does not teach plural wavelength-selecting filters and does not teach plural hollow core waveguides guiding light between the wavelength selecting filters.

The above three limitations are clearly set out in Applicants' independent claim 1 and are just as clearly missing from the Tu reference. Should the Examiner believe these to be disclosed somewhere in Tu, he is respectfully requested to point out the item number, the column and line

number description and the drawing which discloses such structure. Absent such detailed indication, it is clear that the Tu reference does not teach the subject matter of claim 1.

The Examiner's admission "Tu does not teach the waveguides have hollow cores" is very much appreciated. This admission is also very telling because, while the Miura reference teaches the use of hollow-waveguides for the purpose of obtaining a temperature insensitive device, the Examiner apparently does not appreciate that the non-waveguide coupling, especially a free space device (between the alleged filters 303, 304 and 305), provides a **temperature insensitive** device. There would be no motivation to combine the hollow-waveguide sensitivity of Miura when the Tu reference already teaches a relatively temperature insensitive device?

Even if Tu taught a mux/demux, plural wavelength-selecting filters and plural waveguides, it teaches a free-space system which has already solved the problem being solved by the Miura reference, i.e., the desirable temperature insensitivity. There is no reason why one of ordinary skill in the art would seek to substitute the Miura teaching for the teaching in the Tu reference because Tu is already temperature insensitive and therefore would not need the hollow cores taught by Miura.

The Examiner has provided no indication of any "reason" or "motivation" for combining the Tu and Miura references, other than the issue of temperature insensitivity and, as noted above, since Tu is already temperature insensitive, there would be no reason to add the additional complexity of hollow core waveguides from Miura. Thus, there is no reason for combining portions of the Tu and Miura references in the manner of Applicants' independent claims.

In accordance with the above, there is simply no basis for rejection of claims 1-6, 12-14, 17, 19, 22, 23 and 30 under 35 USC §103 over the Tu/Miura combination.

Claims 15 and 16 stand rejected under 35 USC §103 as unpatentable over the Tu/Miura combination, further in view of Bestwick (U.S. Patent 6,101,210). Inasmuch as claims 15 and 16 ultimately depend from claim 1, the above comments distinguishing over the Tu and Miura references separately and in combination are herein incorporated by reference.

The Examiner does not allege that Bestwick contains any motivation for combining the Tu and Miura references, nor does it supply the teachings of the mux/demux, plural wavelength selecting filters and plural waveguides, all required by independent claim 1. Any further rejection of claims 15 and 16 over the Tu/Miura/Bestwick combination is respectfully traversed.

Claim 21 stands rejected under 35 USC §103 as unpatentable over Tu in view of Miura, further in view of Kinoshita (U.S. Publication 2002/0191907). Inasmuch as claim 21 ultimately depends from claim 1, Applicants incorporate by reference the arguments distinguishing over the Tu/Miura combination noted above.

Since there is no allegation that the Kinoshita reference teaches the elements missing from the Tu/Miura combination, i.e., disclosure of a mux/demux, plural wavelength-selecting filters and plural waveguides, the combination of Kinoshita with Tu and Miura still fails to disclose the claimed elements in claim 21. Moreover, there is no reason or motivation for combining these three references due to the reasons already noted with respect to the Tu/Miura combination. Any further rejection of claim 21 over the Tu/Miura/Kinoshita combination is respectfully traversed.

Claims 24, 25 and 27 stand rejected under 35 USC §103 as unpatentable over the Tu/Miura combination, further in view of Okayama (U.S. Patent 6,097,517). Inasmuch as claims 24, 25 and 27 ultimately depend from claim 1, the above comments distinguishing

claim 1 from the Tu and Miura references, both separately and in combination, are herein incorporated by reference.

The Examiner does not allege that Okayama supplies the missing teachings from the Tu/Miura combination, i.e., mux/demux, the missing plural wavelength-selecting filters and the missing plural waveguides. Thus, even if Tu/Miura/Okayama were combined, they would not disclose Applicants' claimed invention.

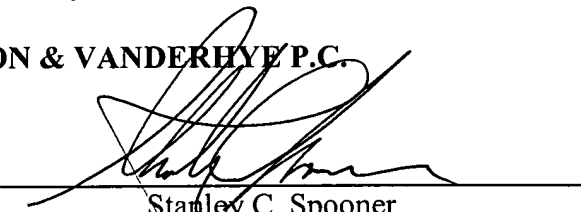
Moreover, the Examiner has failed to provide any motivation for picking and choosing teachings from the Tu, Miura and Okayama references, especially with such teachings combined in the manner of Applicants' claims. Accordingly, any further rejection of claims 24, 25 and 27 under 35 USC §103 is respectfully traversed.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that remaining claims 1-6, 12-17, 19, 21-25, 27 and 30 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is respectfully requested to contact Applicants' undersigned representative.

Respectfully submitted,

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